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14. ABSTRACT

Multinational Experiment 3 was the third event in a series of United States Joint Forces Command (USJFCOM) multinational experiments. Multinational Experiment 3 was a process-refinement experiment whose goal was to build on the lessons learned from Multinational Limited Objective Experiments I and II, and to continue exploring concepts and supporting tools for effects-based planning. Results will assist the development of future processes, organizations, and technologies at the operational and joint task force level of command. Additionally, Multinational Experiment 3 provided the participating nations an opportunity to examine issues associated with operational net assessment, Coalition Interagency Coordination Group, coalition intelligence, surveillance, and reconnaissance, multinational information sharing, logistics, coalition based health services support, information operations, and knowledge management. The North Atlantic Treaty Organization (NATO) also examined concepts associated with their NATO Response Force. This paper will highlight the experiment background, design, objectives, assessment concept, analysis construct, analysis organization, and some of the key analytical findings and lessons learned from the experiment.

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# ***U.S. Joint Forces Command Multinational Experiment 3 – an Overview***

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## **ABSTRACT**

Multinational Experiment 3 was the third event in a series of United States Joint Forces Command (USJFCOM) multinational experiments. Multinational Experiment 3 was a process-refinement experiment whose goal was to build on the lessons learned from Multinational Limited Objective Experiments I and II, and to continue exploring concepts and supporting tools for effects-based planning. Results will assist the development of future processes, organizations, and technologies at the operational and joint task force level of command. Additionally, Multinational Experiment 3 provided the participating nations an opportunity to examine issues associated with operational net assessment, Coalition Interagency Coordination Group, coalition intelligence, surveillance, and reconnaissance, multinational information sharing, logistics, coalition based health services support, information operations, and knowledge management. The North Atlantic Treaty Organization (NATO) also examined concepts associated with their NATO Response Force. This paper will highlight the experiment background, design, objectives, assessment concept, analysis construct, analysis organization, and some of the key analytical findings and lessons learned from the experiment.

## **ACKNOWLEDGEMENTS**

This paper is derived, for the most part, from the experiment reports listed in the Bibliography. The author would like to acknowledge the significant contributions of a talented multinational analysis team which he had the privilege to lead. Members of this team are listed at the end of the paper. All contributed to the experiment design, analysis and production of these experiment reports.

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## EXPERIMENT DESIGN

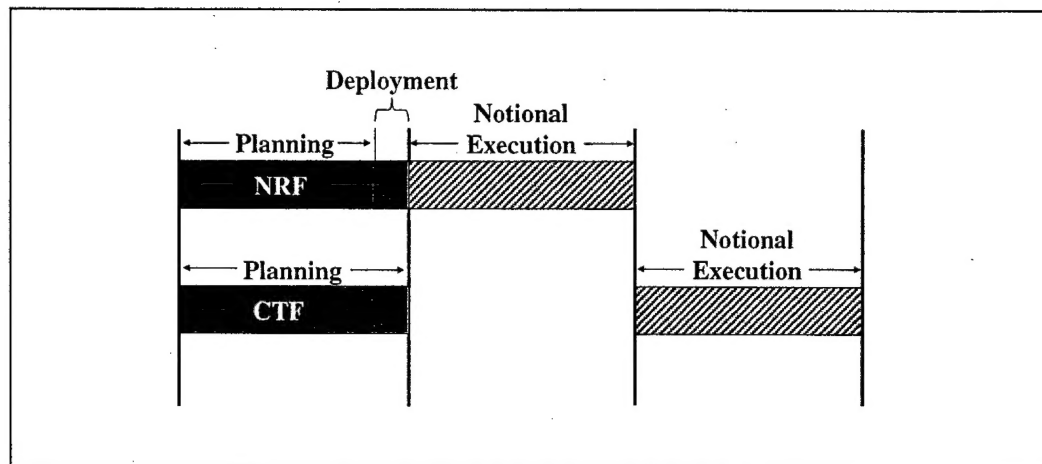
As several nations had already developed their own variations of an EBP concept prior to MNE 3, it was necessary to write a new version of the EBP concept specifically for MNE 3. This version was based on features from the national EBP concepts and provided a common baseline for MNE 3.

To examine the viability of and the procedures required for implementing EBP, certain overarching and supporting concepts were required to accurately depict the planning environment. These included: ONA, CIE, Coalition Interagency Coordination Group (CIACG), Coalition Intelligence, Surveillance and Reconnaissance (CISR), MNIS, Logistics, Coalition Based Health Services Support (CBHSS), Information Operations (IO), and Knowledge Management (KM).

The United States chose to implement a distributed Coalition Task Force Headquarters (CTFHQ) based on the Standing Joint Force Headquarters (SJFHQ) organizational construct linked by a wide area network (WAN). The Combined Federated Battle Laboratories (CFBL) Network formed the backbone of the WAN. All partner nations provided personnel to man the CTFHQ. The CTF Command group and functional leads were physically located in the USJFCOM Distributed Continuous Experiment Environment Lab (DCEE). All other participants were physically located in their home nation facilities. The experiment was designed so that NATO and Allied Command Transformation (ACT) would examine and implement the EBP process in parallel with the CTFHQ. The NATO Response Force (NRF) headquarters was largely co-located.

Specific participation facility locations included:

Participant	Location
Australia	1. Defence Science and Technology Organization, Fern Hill Park, Canberra, ACT
Canada	1. Canadian Forces Experimentation Centre, Shirley's Bay Detachment, Ottawa
France	1. CIADIOS, Taverny AB (BA 921), Taverny
Germany	1. Bundeswehr Military Intelligence Center (BMIC) Grafschaft-Gelsdorf 2. Bundeswehr Center for Analyses and Studies – OR Division, Ottobrunn 3. Bundeswehr Operations Command, Potsdam 4. Bundeswehr ADP – Support Center, Euskirchen
United Kingdom	1. Defence Science Technology Laboratory Portsmouth West Facility, Fareham Hampshire
United States	1. Distributed Continuous Experiment Environment, USJFCOM/J9, 115 Lake View Parkway, Suffolk, VA 2. Joint Battle Center, 116 Lake View Parkway, Suffolk, VA 3. Defense Information Systems Agency AITS/JPO, Arlington, VA
NATO	1. Castlegate, Germany



**Figure 2: MNE 3 Construct**

During the planning of the experiment, there were design considerations that would influence the conduct of the experiment and the results.

- ❑ Experiment goals were ambitious due to the first time integration of a highly complex process, organization, and new technology.
- ❑ The experiment used 8 hours of operational play per day instead of 24 hours.
- ❑ MNE 3 was a single trial experiment; however, it is just one piece of a larger experimentation plan conducted by USJFCOM concerning these concepts.
- ❑ Participant training and knowledge of the concepts was less than envisaged upon fielding of the concepts.
- ❑ Training and rehearsal intended to occur during the experiment validation event (Rock Drill) did not happen as planned. Instead the time was used to complete the development of tactics, techniques, and procedures (TTP) for the process.
- ❑ Component and higher-level command play was limited to white cell responses.

During experiment execution, limitations emerged that influenced experiment play and subsequent analysis.

- ❑ Disconnects and gaps between steps in the planning process were not adequately resolved prior to experiment start.
- ❑ TTP stated what needed to be done but not how to complete tasks.
- ❑ It was unclear how the supporting concepts would be integrated into the planning process.
- ❑ Players came to the experiment with different perceptions of what a command-led process should be.
- ❑ Players had to spend time during Week 0, intended for a walk-through of the process, for team-building and concept of operations briefings.
- ❑ Players were too inexperienced with the organizational construct and daily battle rhythm, which impacted negatively on the conduct of the EBP process.
- ❑ Players had no prior exposure to the EBP planning tool before Week 0.

- Does the Coalition-Based Health Services Support process support EBP?

EBP depends on a complex array of processes. These processes involve the integration of many concepts into one coordinated endeavor. If these concepts are employed to their full extent, and each contributes necessary information to EBP, the CTF and NRF will be successful in performing EBP. Successful EBP performance is defined by the ability to meet the six requirements identified in proposition 1.

The MNE 3 EBP concept describes a 13-step process that begins with the identification, in the Commander's Initial Guidance, of key effects to be considered, develops a detailed assessment of the numerous effects and actions that can be taken against nodes needed to achieve these key effects, and examines the resources available to be used to accomplish these actions. It then develops a single course of action (COA), where considered military and possibly nonmilitary actions are then synchronized. The result of this is a single plan reflected in the ETO. The steps are essentially sequential but some parts of the process may be conducted in parallel, and the complete process would require several iterations to refine the overall plan for EBO.

**Objective 2:** Develop and assess organizations to support coalition and NRF EBP.

Proposition 2: The EBP organizational design will:

- Enable the flow of information
- Facilitate the generation of knowledge
- Enhance planning
- Improve decision making and
- Produce an effective ETO.
- COIs
  - What organizational structure is required for EBP?
  - What behaviors and competencies are required for EBP?
  - What mitigating human factors impact upon EBP?

The CTFHQ and XDJTFHQ organizational structures identified for MNE 3 were based upon the design of cross-functional teams connected in a habitual way to distributed experts including nonmilitary government and civilian agencies and coalition partners. The staff was organized to enable the effective flow and integration of information. It was expected that the elimination of functional "stovepipes" would reduce coordination time and allow synergistic planning and execution. The fluid movement of information between people via machine interfaces was both a challenge and an opportunity for commanders. It was proposed that if managed properly, this organizational structure would produce better decisions faster and ultimately, the output of the EBP process, the ETO, would produce the desired effects when executed.

**Objective 3:** Identify technology requirements to support coalition and NRF EBP.

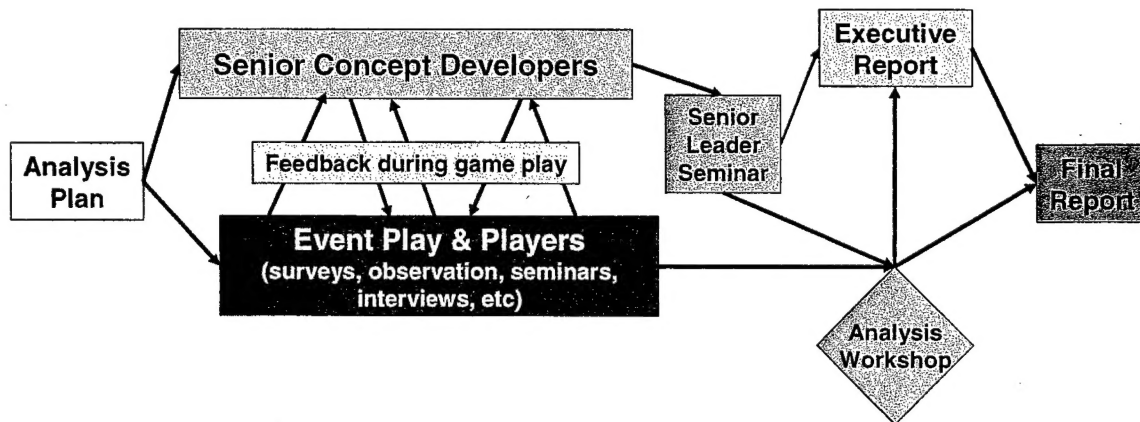
Proposition 3: Technology will augment the human ability to conduct EBP through a suite of tools.

- COI

Objective 3 Methodology. Qualitative and quantitative data were used to assess MNE 3 implemented technologies, and to identify functionality requirements for EBP. The aim was to identify technology requirements to support coalition and NRF EBP.

Furthermore, an experiment analysis workshop was convened to enable all analysts to contribute their inputs to the final report. Partners discussed their insights into the objectives and concepts for which they had lead analysis responsibility, as well as proposed experiment findings.

Figure 3 depicts the sequence of events in the analysis and reporting process.



**Figure 3: MNE 3 Analysis Construct**

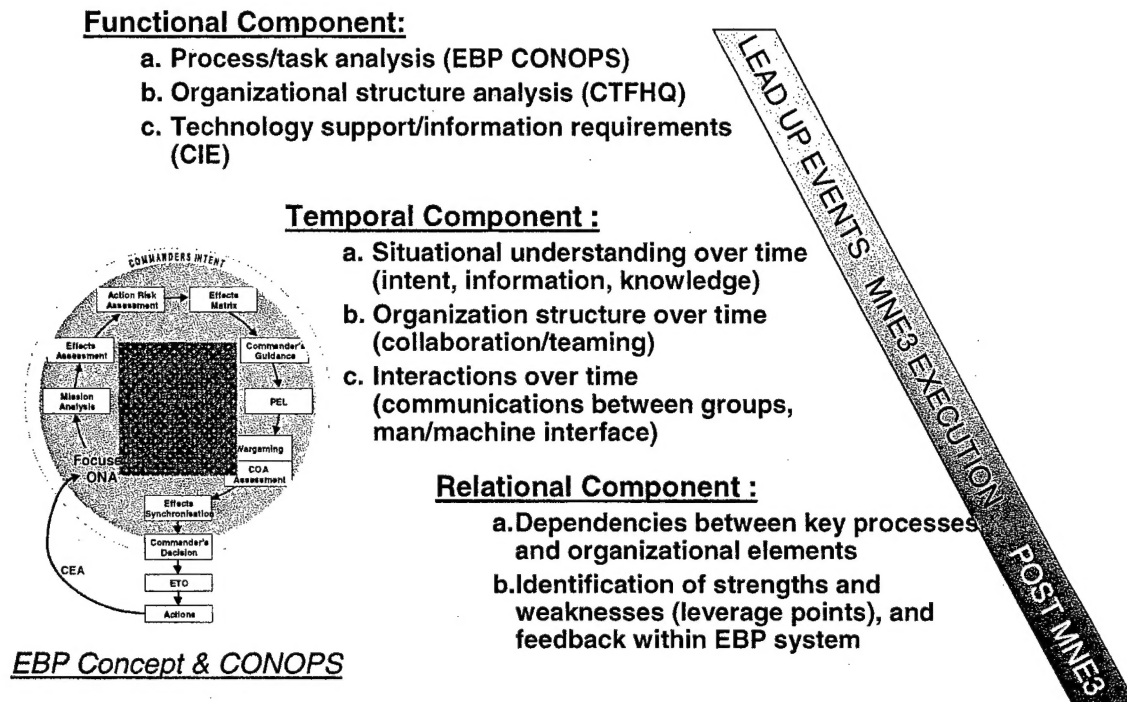
#### ANALYSIS ORGANIZATION

The analysis team was organized to support the analysis functions of the experiment: assessment planning, data collection, data analysis, and reporting. All partner-nation analysts were completely integrated into the analysis team. The responsibility to lead the analysis effort for specific objectives and concepts was divided amongst the partner analysis teams.

The hierarchy of data flow and organization for the analyst team and observers is depicted in Figure 4.

## PROCESS MODELING

Conceptual models representing the functional and temporal aspects of EBP and supporting processes, organizations, and technologies were developed using the G2 and C3TRACE process model tools. These models captured internal and external tasks, processes, organization, and communications played during the experiment. The models were developed during the experiment validation Rock Drill and the experiment. Figure 6 depicts the components of the conceptual models.



**Figure 6: Conceptual Model Components**

The output of these models can then be compared to the physical model of the processes, organizations, and technologies employed by the CTFHQ as well as the XDJTFHQ during experiment execution to build a relational understanding of key processes and organizational elements. These measurements and observations are then used to update conceptual models so as to document the developed EBP process for subsequent experimentation.



The SCDs also made ten high-level observations arising from the experiment's in-focus sessions, participant seminars, and AARs. The following paragraphs describe these observations.

#### *Multinational Effects-Based Operations*

The process, organization and technologies used in MNE 3 require further experimental refinement before they are ready for operational use. SCDs offered the following observations:

- ❑ Effects-based operations are not necessarily new, but encourage a new way of thinking; help to focus on the strategic aim
- ❑ Effects-based thinking gives a broader range of options for the employment of military and other interagency actions
- ❑ EBO provides a coherent Diplomatic, Information, Military, Economic (DIME) planning process
- ❑ EBO causes a more holistic view of the key actors and adversaries (political, military, economic, social, infrastructure, information)

#### *Coalition Operational Net Assessment (Knowledge Base)*

- ❑ A common ONA is an essential enabler of coalition operations
- ❑ The utility of the coalition ONA is dependent upon nations being able to share relevant data
- ❑ National ONAs must be interoperable, able to be merged when a coalition forms
- ❑ The ONA must incorporate expert judgments of the adversary, potential spoilers, the operational environment, and ourselves – Red/Blue wargaming
- ❑ A visualization tool used to display effects and relationships contained within the ONA will help to convey commander's intent and situational awareness to all levels

#### *The Networked Coalition*

- ❑ To effectively network, a coalition requires the highest possible degree of information sharing
- ❑ A networked coalition employing EBO:
  - Facilitates mission-oriented operations by involved government agencies and cooperation from non government agencies
  - Contributes to mutual understanding and confidence amongst the coalition partners
  - Has the ability to tailor Diplomatic, Information, Military, Economic (DIME) effects, actions and assess outcomes more precisely and more rapidly
  - Will be more effective when there is a mixture of face-to-face, virtual collaboration and prior common training

#### *Harmonize Nonmilitary Capabilities of Governments*

- ❑ A robust CIACG proved essential; however, we need to clearly define roles and procedures for the CIACG
- ❑ Incorporating nonmilitary capabilities of government into the early stages of the planning process, including ONA development, is essential



- ❑ Training that focuses on the challenges of Stability Operations e.g. individual skills and decentralized operations

#### *Coalition Deployment, Employment, and Sustainment*

- ❑ Coalition EBO may require national logistics organizations to adapt
- ❑ EBO requires the coalition commander to have some limited logistics authority over the whole force
- ❑ Logistics planning must be fully integrated from the start of the effects-based planning process
- ❑ EBO underscores the need to plan for the timely deployment, sustainment and protection of the civilian capacity to create desired effects

#### *Leader Competencies*

Leadership in a coalition collaborative information environment requires somewhat different skills than today's command and control environment (information age vice industrial age). Among the issues that will require a different approach:

- ❑ Coping with cultural and doctrinal differences
- ❑ Establishing trust and confidence
- ❑ Building habitual relationships
- ❑ Exploiting speed of developing knowledge and decision-making
- ❑ Ensuring comprehensive information sharing and timely dissemination
- ❑ Mastering information overload
- ❑ Partnering with civilian authorities
- ❑ Crafting and communicating Commander's intent

Key participant findings from MNE 3 were:

- ❑ The EBP concept has the potential to make the CTF/NRF a more effective instrument of power. However, the EBP concept developed for MNE 3 is not operationally mature and requires further refinement
- ❑ Players stated that the best features of the EBP process were:
  - it forced military planners to think in terms of effects, which expanded alternative ways to achieve objectives beyond military actions, and
  - collaboration brought out the best ideas from a collective thought process
- ❑ Players stated the most difficult parts of the MNE 3 EBP process were:
  - the complexity of the process inhibiting thought and analysis
  - understanding the process
  - confusing terminology
  - lack of an integrated tool suite, and
  - particular difficulty implementing the course of action/wargaming step
- ❑ There is a need to create a coalition logistics structure and plan as a coalition, not as group of individual nations
- ❑ The CIACG brings a valuable civilian perspective to military planners, the CTF staff and the command group that is essential to an effective EBP process
- ❑ Contributions from subject matter experts such as CIACG and information operations need to be integrated in the ONA

	Assessed as "Correct"	Assessed as "Incorrect"
Actually Correct	<i>HIT</i>	<i>MISS</i> (error)
Actually Incorrect	<i>FALSE ALARM</i> (error)	<i>CORRECT REJECTION</i>

**Figure 7: Interpretation of Responses within the Signal Detection Paradigm**

This provides a performance measure but also gives an insight into the bias of the participants. For example, it is possible to ascertain whether groups or individuals are more likely to agree with false information or reject true information.

The understanding and probe statements were administered to the participants on 4 occasions at significant stages of process which required good common intent for EBP to work. The responses were examined by staff role, functional groups and physical location.

The UK analysis team took the lead in the development and analysis of the common intent probes. A brief summary of their conclusions follows.

- Overall it would appear that the commander's intent was not effectively dispersed beyond the command team, CIACG and plans team. This conclusion should be tempered with the caveat that these data represent only the very first steps in trying to quantitatively measure the commander's intent and they were collected in an experimental environment using a coalition type command structure.
- The measurement methodology employed appears to measure the promulgation of commander's intent across different sites. The method appears to capture sensible findings, such as the command team has a better understanding of the command intent than the rest of the CTFHQ. Collecting good data in a "field experiment" is extremely difficult and this method appears to be able to collect robust data without undue interference with the HQ staff.
- It would appear that the promulgation of commander's intent is influenced by organizational proximity to the commander and not geographic proximity to the commander. This is supported by the U.S. site not having a greater understanding of commander's intent than other nations but those in the command team (organizationally and geographically close to the commander) did have a good understanding of commander's intent. The plans team, who were geographically

Multinational experimentation continues to be a critical element of USJFCOM's joint concept development and experimentation program. The body of data collected during the multinational experimentation series, as well as insights from an even larger body of USJFCOM and multinational experiments, will guide MNE 4. Each event in the chain brings us closer to fielding the SJFHQ, to delivering innovation to the warfighter, and to recommending actions to senior leaders based on experimental findings.

Ultimately, the multinational experimentation program will result in better coalition warfare when the United States and its partners around the world apply their military forces. Dissimilar capabilities and perspectives must not hinder the ability to work together in combined military operations to address complex international issues. By working together in a dedicated multinational experimentation program, the United States and its allies ensure that they experiment as they fight.

WAN – Wide Area Network

XDJTFHQ – NATO Experimental Deployable Joint Task Force Headquarters

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